CA 725

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA725)

Current Human Exposures Under Control

Facility Name: *3M COMPANY, Cordova*
Facility Address: *22614 Highway 84 North, Cordova, Illinois*
Facility EPA ID #: *ILD054236443*

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

X If yes - check here and continue with #2 below.

____ If no - re-evaluate existing data, or

____ if data are not available skip to #6 and enter"IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be **"contaminated"**[1] above appropriately protective risk-based "levels" (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

	Yes	No	?	Rationale / Key Contaminants
Groundwater		x		
Air (indoors)[2]		x		
Surface Soil (e.g., <2 ft)		x		
Surface Water		x		
Sediment		x		
Subsurf. Soil (e.g., >2 ft)		x		
Air (outdoors)		x		

X — If no (for all media) - skip to #6, and enter "YE," status code after providing or citing appropriate "levels," and referencing sufficient supporting documentation demonstrating that these "levels" are not exceeded.

___ If yes (for any media) - continue after identifying key contaminants in each "contaminated" medium, citing appropriate "levels" (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

___ If unknown (for any media) - skip to #6 and enter "IN" status code.

Rationale and Reference(s): *The RFI data indicates that all parameters included in the RFI were either not detected or were below the U.S. EPA Region 5 Data Quality Levels (DQLs), or were below U.S. EPA National or Secondary Drinking Water Standards (for groundwater samples), with the following exceptions: (1) Arsenic (As) levels in the soil in the Sludge Incorporation Areas were greater than U.S. EPA Region 5 DQLs. However, data presented by 3M in Appendix 8 of Volume 2 of the July 1998 RFI Report indicate that these concentrations reflect local background conditions and are within the reported range of As in the state of Illinois. (2) Cobalt concentrations in soils are much greater than local background concentrations. But the amounts detected are below a calculated risk-based Preliminary Remediation Goal (PRG) for Cobalt (Co), which was approved by our Waste Management Branch risk assessor. [Co has not been detected in the groundwater since a 1989 3M investigation detected it in one well (out of nine that were sampled), at a concentration level of 77 ug/l (PRG=2,000 ug/l). (3) Thallium in soil was slightly above the DQL (6.3 Vs. 6.1 ug/l). However, the risk posed by such level is considered non-significant under current use.-- Note: 3M compared detected values with Region 5 DQLs, an acceptable practice from Dec 95 to May '98. Co does not have a DQL, so comparisons were made using calculated PRGs for soils, and the Region 9 PRG for Co in groundwater (adopted by R-5 in 1998).-* -- **REF:** July 9, 1998 RFI Report (especially Vol. 1 Data Summaries and Appendix 8 of Vol. 2); 3M Cordova 1989/1990 Investigation Report dated Nov. 11, 1990 (groundwater monitoring data summary); and, additional RFI information submitted in correspondence dated Aug. 31, 1998, and Sept. 3 and 4, 1998.

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[1] "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

[2] Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

3. Are there **complete pathways** between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

Potential **Human Receptors** (Under Current Conditions)

"Contaminated" Media	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food[3]
Groundwater	___	___	___	___			___
Air (indoors)	___	___	___				
Soil (surface, e.g., <2 ft)	___	___	___	___	___	___	___
Surface Water	___	___			___	___	___
Sediment	___	___			___	___	___
Soil (subsurface e.g., >2 ft)				___			___
Air (outdoors)	___	___	___	___	___		

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors' spaces for Media which are not "contaminated" as identified in #2 above.

2. enter "yes" or "no" for potential "completeness" under each "Contaminated" Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential "Contaminated" Media - Human Receptor combinations (Pathways) do not have check spaces ("___"). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

____ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

____ If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination) - continue after providing supporting explanation.

____ If unknown (for any "Contaminated" Media - Human Receptor combination) - skip to #6 and enter "IN" status code.

Rationale and Reference(s):

[3] Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

4. Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **"significant"**[4] (i.e., potentially "unacceptable" because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable "levels" (used to identify the "contamination"); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "levels") could result in greater than acceptable risks)?

____ If no (exposures can not be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway) - skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

____ If yes (exposures could be reasonably expected to be "significant" (i.e., potentially "unacceptable") for any complete exposure pathway) - continue after providing a description (of each potentially "unacceptable" exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

____ If unknown (for any complete pathway) - skip to #6 and enter "IN" status code

Rationale and Reference(s):

[4] If there is any question on whether the identified exposures are "significant" (i.e., potentially "unacceptable") consult a human health Risk Assessment specialist with appropriate education, training and experience.

5. Can the "significant" **exposures** (identified in #4) be shown to be within **acceptable** limits?

_____ If yes (all "significant" exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing and referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

_____ If no (there are current exposures that can be reasonably expected to be "unacceptable")- continue and enter "NO" status code after providing a description of each potentially "unacceptable" exposure.

_____ If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status code

Rationale and Reference(s):

6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

X YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the ***3M Company***, *Cordova* facility EPA # ***ILD 054236443***, located at ***22614 Highway 84 N, Cordova, Illinois*** under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

____ NO - "Current Human Exposures" are NOT "Under Control."

____ IN - More information is needed to make a determination.

Completed by	(signature)	*(Signed)*	Date 01/22/99
	(print)	Juana E. Rojo	
	(title)	Corrective Action Project Manager	

Supervisor	(signature)	*(Signed)*	Date 01/29/99
	(print)	Hak K. Cho	
	(title)	Chief, IL/IN/MI Permit Section	
	(EPA Region or State)	Region 5, IL	

Locations where References may be found:

RCRA Files, at U.S. EPA Region 5 , 77 West Jackson Blvd., Chicago, IL 60164

Contact telephone and e-mail numbers

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(phone #)	(312) 886-0990
(e-mail)	rojo.juana@epa.gov

FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.

CA 750

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA750)

Migration of Contaminated Groundwater Under Control

Facility Name:	*3M COMPANY, Cordova*
Facility Address:	*22614 Highway 84 North, Cordova, Illinois*
Facility EPA ID #:	*ILD054236443*

1. Has **all** available relevant/significant information on known and reasonably suspected releases to the groundwater media, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

____ If yes - check here and continue with #2 below.

____ If no - re-evaluate existing data, or

____ if data are not available skip to #6 and enter"IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Migration of Contaminated Groundwater Under Control" EI

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated ground water and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

2. Is **groundwater** known or reasonably suspected to be **"contaminated"**[1] above appropriately protective "levels" (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

____ If yes - continue after identifying key contaminants, citing appropriate "levels," and referencing supporting documentation.

X If no - skip to #8 and enter "YE" status code, after citing appropriate "levels," and referencing supporting documentation to demonstrate that groundwater is not "contaminated."

____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s): All parameters included in the RFI for groundwater samples (except Arsenic) were either nondetect or were below the U.S. EPA Region 5 Data Quality Levels (DQLs), or were below the U.S. EPA Region 5 National or Secondary Drinking Water Standards. The following should be noted: (1) Arsenic was detected in a few groundwater samples at levels slightly higher than DQLs, but lower than the current Maximum Contaminant Level (MCL) for Arsenic in groundwater. (2) Chloroform was detected in some wells. However, chloroform was also present in blank samples taken during the groundwater sampling events, at similar and higher levels, which seems to indicate that the equipment or the laboratory water was contaminated. (3) Strontium was also detected in the groundwater at levels in the range of 150 to 350 ug/l. (And at levels up to 390 ug/l in 1989). The current Preliminary Remediation Goal (PRG) for Strontium as developed by U.S. EPA Region is 22,000 ug/l. (4) Cobalt was not detected in the 1997-1998 groundwater investigations. However, it was detected in 1989 in one of nine wells sampled, at a level of 77 ug/l, a concentration level much lower than the currently used Region 9 PRG of 2,200 ug/L. [It should also ne noted that neither Cobalt nor Strontium are listed in 40CFR 261 Appendix IX of 40 CFR 264.]
REF: July 9, 1998 RFI Report (especially Vol. 1 Data Summaries and Appendix 8 of Vol. 2); 3M Cordova 1989/1990 Investigation Report dated Nov. 11, 1990 (groundwater monitoring data summary); and additional RFI information submitted in correspondence dated August 31, 1998, and September 3, and 4, 1998. [Discussions on trip blanks, equipment blanks, etc., are included along with tabulated data, in Volume 1, Sections 3.2.2.3 thru 3.3.3.2 and Tables 5-9 thru 5-11. Also Tables 8-5 thru 8-7 and Table 8-9 (recent 1998 data).

[1] "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate "levels" (appropriate for the protection of the groundwater resource and its beneficial uses).

3. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within "existing area of contaminated groundwater"[2] as defined by the monitoring locations designated at the time of this determination)?

____ If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the "existing area of groundwater contamination"[2]).

____ If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the "existing area of groundwater contamination"[2]) - skip to #8 and enter "NO" status code, after providing an explanation.

____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):

[2] "existing area of contaminated groundwater" is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of "contamination" that can and will be sampled/tested in the future to physically verify that all "contaminated" groundwater remains within this area, and that the further migration of "contaminated" groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

4. Does "contaminated" groundwater **discharge** into **surface water** bodies?

_____ If yes - continue after identifying potentially affected surface water bodies.

_____ If no - skip to #7 (and enter a "YE" status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater "contamination" does not enter surface water bodies.

_____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):

5. Is the **discharge** of "contaminated" groundwater into surface water likely to be **"insignificant"** (i.e., the maximum concentration[3] of each contaminant discharging into surface water is less than 10 times their appropriate groundwater "level," and there are no other conditions (e.g., the nature, and number, of discharging contaminants, or environmental setting), which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?

____ If yes - skip to #7 (and enter "YE" status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration[3] of key contaminants discharged above their groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) provide a statement of professional judgement/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.

____ If no - (the discharge of "contaminated" groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration[3] of each contaminant discharged above its groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations[3] greater than 100 times their appropriate groundwater "levels," the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identify if there is evidence that the amount of discharging contaminants is increasing.

____ If unknown - enter "IN" status code in #8.

Rationale and Reference(s):

[3] As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

6. Can the **discharge** of "contaminated" groundwater into surface water be shown to be "**currently acceptable**" (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented[4])?

____ If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site's surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR 2) providing or referencing an interim-assessment,[5] appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment "levels," as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

____ If no - (the discharge of "contaminated" groundwater can not be shown to be "**currently acceptable**") - skip to #8 and enter "NO" status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

____ If unknown - skip to 8 and enter "IN" status code.

Rationale and Reference(s):

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[4] Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

[5] The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

7. Will groundwater **monitoring** / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the "existing area of contaminated groundwater?"

____ If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the "existing area of groundwater contamination."

____ If no - enter "NO" status code in #8.

____ If unknown - enter "IN" status code in #8.

Rationale and Reference(s):

8. Check the appropriate RCRIS status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

X YE - Yes, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the ***3M Company,*** Cordova , EPA ***ILD*** **054236443**, located at **22614 Highway 84 North, Cordova, Illinois**. Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater" This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

___ NO - Unacceptable migration of contaminated groundwater is observed or expected.

___ IN - More information is needed to make a determination.

Completed by (signature) (Signed) Date 1/22/99
(print) Juana E. Rojo
(title) Corrective Action Project Manager

Supervisor (signature) (Signed) Date 1/29/99
(print) Hak K. Cho
(title) Chief, IL/IN/MI Permit Section
(EPA Region or State) Region 5, Chicago

Locations where References may be found:

RCRA Files, at U.S. EPA Region 5, 77 West Jackson Blvd., Chicago, IL 60604

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01-29-99

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 1/5/99

RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA725)

No Current Human Exposures* EI
("Human Exposures EI")

Facility Name: 3M Company, Cordova
Facility Address: 22614 Highway 84 North, Cordova, Illinois
Facility EPA ID #: ILD 054 236 443

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

✓ If yes - check here and continue with #2 below.

____ If no - re-evaluate existing data, or

____ if data are not available skip to #6 and enter "IN" (more information needed) status code.

Rationale and Reference(s):

* Of concern, as documented in this EI determination.

2. Is groundwater, soil, surface water, sediments, or air, **media** known or reasonably suspected to be "**contaminated**"[1] above appropriately protective risk-based "levels"(applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

	Yes	No	?	Rationale Key Contaminants
Groundwater	___	___	___	_____
Surface Soil (e.g., <2 ft)	___	___	___	_____
Surface Water	___	___	___	_____
Sediment	___	___	___	_____
Subsurf. Soil (e.g., >2 ft)	___	___	___	_____
Air (indoors, Air_{in})	___	___	___	_____
Air (outdoors, Air_{out})	___	___	___	_____

YE ✓ If no (for all media) - skip to #6, and enter "YE," status code after providing or citing appropriate "levels," and referencing sufficient supporting documentation demonstrating that these "levels" are not exceeded.

____ If yes (for any media) - continue after identifying key contaminants in each "contaminated" medium, citing appropriate "levels" (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

____ If unknown (for any media) - skip to #6 and enter "IN" status code.

Rationale and Reference(s): The July 9, 1998 final RFI Report and additional information submitted on August 31, 1998 and September 3 and 4, 1998, indicate that all parameters included in the RFI were either nondetect or were below the U.S. EPA Region 5 Data Quality Levels (DQLs)* or were below U.S. EPA National or Secondary Drinking Water Standards (for groundwater samples) with the following exceptions:

1.- Arsenic was in the soil in the Sludge Incorporation Areas were greater than Region 5 DQLs. However, data presented by 3M in Appendix No. 8 of Volume 2 of the July 1998 Report indicate that these concentrations reflect local background conditions and are within the reported range of Arsenic in the state of IL.

2.- Cobalt in soil is much greater than local background concentrations. But the amount detected is below a calculated risk-based Preliminary Remediation Goal for this parameter, which was approved by our Waste Management Branch risk assessor. Cobalt has not been detected in the groundwater since a 1989 3M investigation which detected Cobalt in one well out of nine sampled at a concentration level of 77 µg/L, less than the current PRG of 22000 µg/L.

3.- Thallium in soil was slightly above the DQL (6.3 vs 6.1 µg/L). However, the risk posed by such level is considered non-significant under current use.

*Note: 3M compared detected values with Region 5 DQLs, which was an acceptable practice from Dec. '95 to May '98.- Cobalt did not have a DQLs, so comparisons have been made with calculated PRGs for soils, and for groundwater, with the Region 9's PRGs which were adopted by Region 5 in May 1998.

Footnote:

[1] "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

3. Are there **complete pathways** between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

	Potential **Human Receptors** (Under Current Conditions)					
"Contaminated" Media	Res.	Worker	Const.	Tresp.	Recreat.	Food*
Groundwater	___	___	___			___
Soil (surface, e.g., <2 ft)	___	___	___	___	___	___
Surface Water	___	___		___	___	___
Sediment	___	___		___	___	___
Soil (subsurface e.g., >2 ft)			___			___
Air (indoors, Air_{in})	___	___				
Air (outdoors, Air_{out})	___	___	___	___		

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Plausible Receptors' spaces for Media which are not "contaminated") as identified in #2 above.

2. enter "yes" or "no" for potential "completeness" under each "Contaminated" Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probably combinations some potential "Contaminated" Media - Human Receptor combinations (Pathways) do not have check spaces ("___"). While these combinations may not be probable in most situations they may be possible is some settings and should be added as necessary.

_____ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

_____ If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination) - continue after providing supporting explanation.

_____ If unknown (for any "Contaminated" Media - Human Receptor combination) - skip to #6 and enter "IN" status code

Rationale and Reference(s): _____

* Indirect Pathway/Receptor

4 Can the **exposures** from the complete pathways identified above be reasonably expected to be **significant**[2] (i.e., potentially "unacceptable" because the exposures can be reasonably expected to be: 1) greater in magnitude (frequency and/or duration) than that assumed in the derivation of the acceptable "levels" (used to identify the "contamination"); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "levels") could result in greater than acceptable risks)?

_____ If no (exposures can not be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway) - skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to "contamination" (identified in 3 above) can not be reasonably expected to be significant (i.e., potentially "unacceptable").

_____ If yes (exposures could be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway) - continue after providing a description (of each potentially "unacceptable" exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" (identified in 3 above) can not be reasonably expected to be "significant."

_____ If unknown (for any complete pathway) - skip to #6 and enter "IN" status code

Rationale and Reference(s):_____

[2] If there is any question on whether the identified exposures are "significant" (potentially "unacceptable") consult a Risk Assessment specialist with appropriate education, training and experience.

5 Have the "significant" **exposures** (identified in 4 above) been shown to be within **acceptable** limits?

_____ If yes (all "significant" (potentially "unacceptable") exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing and referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

_____ If no (there remain exposures that can be reasonably expected to be "unacceptable")- continue and enter "NO" status code after providing a description each potentially "unacceptable" exposure.

_____ If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status code

Rationale and Reference(s):

6. Check the appropriate RCRIS status codes for Human Exposures EI event code CA725, and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

✓ YE - Yes. "No Current Human Exposures" (of concern) can be verified. Based on a review of the information contained in this EI Determination, "No Current Human Exposures" (of concern) are expected at the 3M Company, Cordova, IL facility, EPA ID # ILD054236443 located at 22614 Highway 84N, Cordova under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

___ NO - "Current Human Exposures" (of concern) can be expected.

___ IN - More information is needed to make a determination.

Completed by (signature) Juana E. Rojo Date 01/22/99
(print) Juana E. Rojo
(title) Corrective Action Project Mgr.

Supervisor (signature) [signature] Date 1/29/99
(print) HAK K. CHO
(title) CHIEF, IL/IN/MI PERMIT SECTION

Locations where References may be found: The RCRA Files / Administrative Record and specifically: July 9, 1998 RFI Report, Volume 1 Data Summaries. Specific discussions on Arsenic and Cobalt are found in Appendix 8 of Volume 2 of the 07/09/1998 RFI Report and correspondence from August 31, 1998 and September 3 and 4, 1998 in the Corrective Action Correspondence folder. Specific data regarding Cobalt and Strontium can be found in the gw monitoring data summary in the "3M Cordova 1989/1990 Investigation Report," 11/28/90. Discussions on blank samples are found mainly in Volume I (RFI Report, 7/98) sections 3.2.2.3 thru 3.3.3.2.

Contact telephone and e-mail numbers

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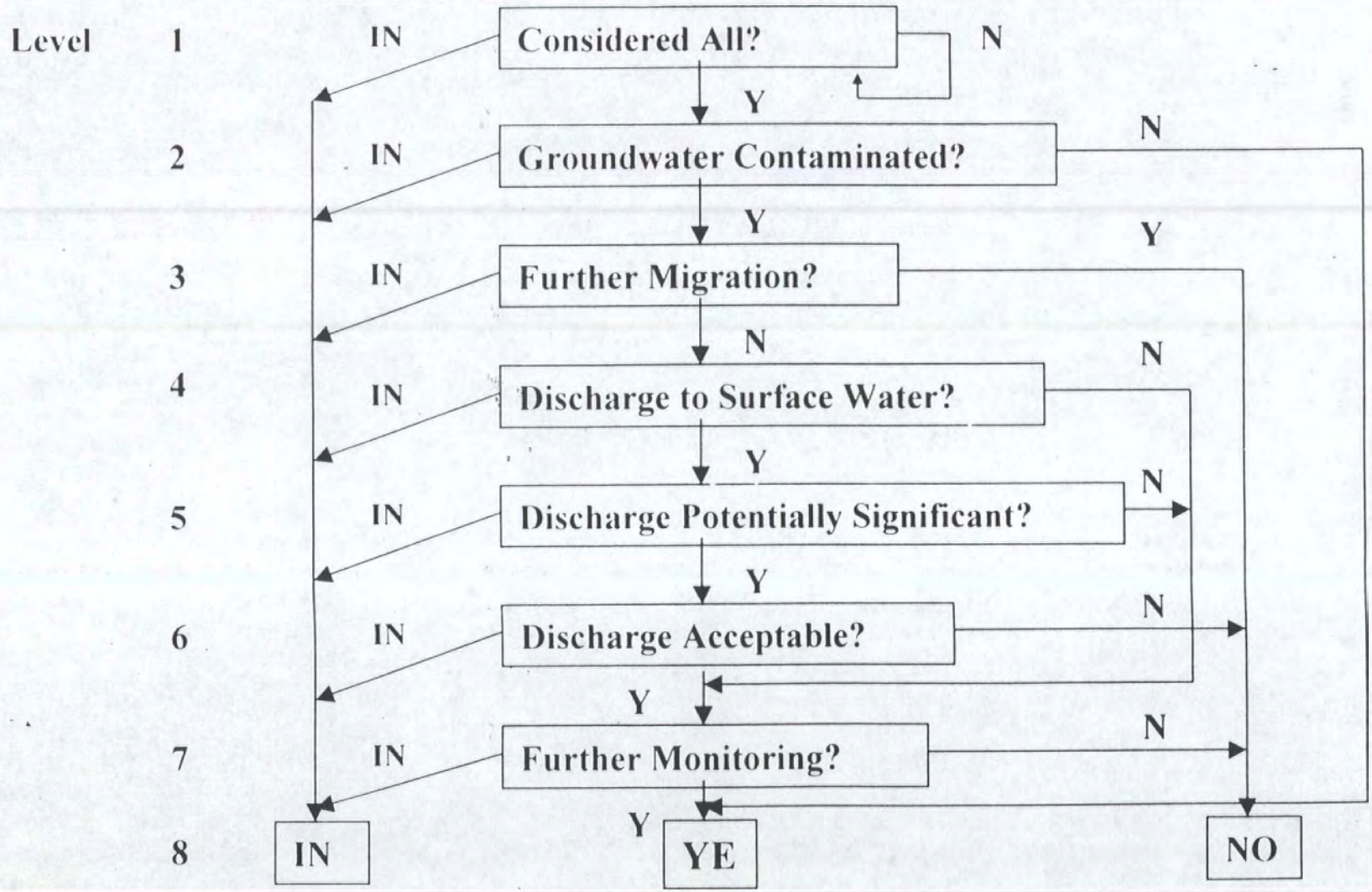
FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.

No Further Migration of Contaminated Groundwater (CA750)



Summary of
RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA750)
No Further Migration of Contaminated Groundwater EI
("Groundwater EI")

Interim Final 1/5/99

Objective

To identify, track, and help prevent the spread of contamination by the further migration of "contaminated"* groundwater.

Definition

A positive "No Further Migration of Contaminated Groundwater" EI determination ("YE" status code) indicates that no further migration of "contaminated"[1] groundwater is occurring or expected, based on physical evidence.

Implementation Objectives

1. To ensure the best understanding of the contaminated groundwater is used in the determination.

2. To determine if there is any groundwater "contamination" of concern.

3. To determine if the further (horizontal or vertical) migration of contaminated groundwater is occurring or expected.

4. To determine if "contaminated" groundwater discharges into surface water bodies.

5. To determine if the discharge of "contaminated" groundwater into surface water is "potentially significant."

6. To determine if the discharge of "contaminated" groundwater into surface water is "acceptable." **

7. To ensure that additional data will be collected in the future to demonstrate that there continues to be no further migration of "contaminated" groundwater.

8. To ensure the determinations are verifiable.

Duration / Applicability

EI Determinations status codes should remain in RCRIS database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

Footnotes

* "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, or solids, that are subject to RCRA) in concentrations in excess of appropriate standards, guidelines, or criteria (for that media).

** "acceptable" (i.e., not cause unacceptable impacts to surface water, sediments or eco-systems).

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 1/5/99

RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA750)

No Further Migration of Contaminated Groundwater EI
("Groundwater Migration EI")

Facility Name: 3M Company, Cordova
Facility Address: 22614 Higway 84 North, Cordova, Illinois
Facility EPA ID #: ILD 054 236 443

1. Has **all** available relevant/significant information on known and reasonably suspected releases to the groundwater media, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

✓ If yes - check here and continue with #2 below.

____ If no - re-evaluate existing data, or

____ if data are not available, skip to #8 and enter"IN" (more information needed) status code.

Rationale and Reference(s):

2. Is **groundwater** known or reasonably suspected to be **"contaminated"**[1] above appropriately protective "levels" (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

____ If yes - continue after identifying key contaminants, citing appropriate "levels," and referencing supporting documentation.

✓ If no - skip to #8 and enter "YE" status code, after citing appropriate "levels," and referencing supporting documentation to demonstrate that groundwater is not "contaminated."

____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s): July 1998 final Report and additional information submitted on August 31, 1998, and September 3 and 4, 1998 indicate that: All parametets included in the RFI for groundwater samples were either nondetect or were below the U.S. EPA Region Data Quality Levels (DQLs), or were below the U.S. EPA National or Secondary Drinking Water Standards. However, it should be noted that:

1- Arsenic was detected in a few groundwater samples at levels slightly higher than DQLs, but lower than the current Maximum Contaminant Level (MCL) in groundwater.

2- Chloroform was detected in some wells. However, chloroform was also present in blank samples taken during the groundwater sampling events and at similar and higher levels which seems to indicate that the equipment or the laboratory water was contaminated. *

3- Strontium was also detected in the gw at levels in the range of 150 to 350 µg/l. (And at levels up to 390 µg/l in 1989). The current Preliminary Remediation Goal for Strontium, as developed by U.S. EPA Region 9 is 22,000 µg/l.

Cobalt has not been detected in the 1997-1998 gw investigations. However, it was detected in 1989 in one of nine wells sampled at a level of 77 µg/l, a concentration level much lower than the currently used Region 9 PRG of 22, µg/l.

It should also be noted that neither Cobalt nor Strontium are listed in 40 CFR 261 Appendix VIII, or Appendix IX of 40 CFR 264.

Footnotes:

[1] "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, or solids, that are subject to RCRA) in concentrations in excess of appropriate "levels" (appropriate for the protection of the groundwater resource and its beneficial uses).

* Discussions on trip blanks, equipment blanks, etc., are included, along with tabulated data, in Volume 1, Sections 3.2.2.3 thru 3.3.3.2 and Tables 5-9 thru 5-11. Also Tables 8-5 thru 8-7 and Table 8-9 (recent 1998 data)

3. Is the **further migration** contaminated groundwater (beyond the "existing area of contaminated groundwater"[2]) observed or reasonably expected?

_____ If no - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale that no further (horizontal or vertical) migration of "contaminated" groundwater is occurring or expected (i.e., beyond the "existing area of groundwater contamination"[2]).

_____ If yes - skip to #8 and enter "NO" status code, after providing an explanation.

_____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):

[2] "existing area of contaminated groundwater" is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and includes designated locations proximate to the outer perimeter of "contamination" that can and will be sampled/tested in the future to physically verify that all "contaminated" groundwater remains within this area, and that the further migration of "contaminated" groundwater" is not occurring. Reasonable allowances in the proximity of the monitoring points are permissible to incorporate final remedy decisions allowing a limited area for natural attenuation.

4. Does "contaminated" groundwater **discharge** into **surface water** bodies?

_____ If yes - continue after identifying potentially affected surface water bodies.

_____ If no - skip to #7 after providing an explanation and/or referencing documentation supporting that groundwater "contamination" does not enter surface water bodies.

_____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):

5. Is the **discharge** of "contaminated" groundwater into surface water **"potentially significant"** (i.e., is the maximum concentration of any contaminant discharging into surface water is greater than 10 times the appropriate groundwater "level," or does the nature, or number, of discharging contaminants, or environmental conditions, increase the potential for detrimental impacts to surface water, sediments, or eco-systems at lower concentrations)?

_____ If no - skip to #7 and enter "YE" status code, after documenting: 1) the maximum known or reasonably suspected concentration of key contaminants discharged above their groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) provide a statement of explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not detrimental to the receiving surface water, sediments, or eco-system.

_____ If yes - (the discharge of "contaminated" groundwater into surface water is "potentially significant") - continue after documenting: 1) the maximum known or reasonably suspected concentration of each contaminant discharged above its groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) the estimated total amount (mass) of each of the contaminants that are being discharged (loaded) into the surface water body in concentrations greater than 100 times their appropriate groundwater "levels," on an annual basis, and identify if there is evidence that the amount of discharging contaminants is increasing.

_____ If unknown - enter "IN" status code in #8.

Rationale and Reference(s): _____

6. Has the **discharge** of "contaminated" groundwater into surface water been shown to be "**acceptable**" (i.e., not cause unacceptable impacts to surface water, sediments or eco-systems)?

_____ If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site's surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; or 2) providing or referencing an assessment[3] with documentation demonstrating that the discharge of groundwater contaminants into the surface water is not detrimental to the receiving surface water, sediments, or eco-systems (which should include surface water and sediment sample results and comparisons to available and appropriate surface water and sediment "levels"(or a clear explanation of the scientific basis that makes this unnecessary)), as well as any other factors, such as effects on ecological receptors (e.g., bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

_____ If no - (the discharge of "contaminated" groundwater into surface water has not been shown to be "**acceptable**") - skip to #8 and enter "NO" status code, after documenting any observed or potentially unacceptable impacts to the surface water body, sediments, and/or eco-systems.

_____ If unknown - skip to 8 and enter "IN" status code.

Rationale and Reference(s):_____

[3] "The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance (and develop site-specific criteria (for the protection of the site's surface water, sediments, and eco-systems) where-ever possible).

7. Will groundwater **monitoring** data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that there is no further horizontal (or vertical, as necessary) migration of the "contaminated" groundwater?

_____ If yes - continue after providing or citing documentation for planned activities or future sampling measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3 above) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the "existing area of groundwater contamination."

_____ If no - enter "NO" status code in #8.

_____ If unknown - enter "IN" status code in #8.

Rationale and Reference(s):

8. Check the appropriate RCRIS status codes for Groundwater EI event code CA750, and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

✓ YE - Yes, "No Further Migration of Contaminated Groundwater" can be verified. Based on a review of the information contained in this EI determination, it has been determined that there is no further migration of contaminated groundwater at the 3M Company, Cordova facility, EPA ID # ILD 054236443 located at 22614 Highway 84 N, Cordova, IL Specifically, this determination indicates that "No Further Migration of Contaminated Groundwater" is observed or expected. This determination will be re-evaluated if the Agency becomes aware of significant changes at the facility.

____ NO - Further migration of contaminated groundwater is observed or expected.

____ IN - More information is needed to make a determination.

Completed by (signature) Juana E. Rojo Date 01/22/99
(print) Juana E. Rojo
(title) Corrective Action Project Mgr.

Supervisor (signature) [signature] Date 1/29/99
(print) HAK K. CHO
(title) CHIEF, IL/IN/MI PERMIT SECTION

Locations where References may be found: Administrative Record, kept in RCRA Files. July 9, 1998, RFI Report, Volume I contains summaries of the investigations & tables showing gw and soil data collected in '97 & '98. Specific discussions on Arsenic and Cobalt are found in Appendix 8 of Volume 2 & Correspondence from 3M dated August 31, 1998 and Sept. 3 and 4, 1998, kept in the CA correspondence folder. —Discussions on blank samples are found in Volume 1 of the 07/09/98 RFI Report, sections 3.2.2.3 thru 3.3.3.2 and Tables 5-9 thru 5-11. Also Tables 8-5 thru 8-7 & table 8-9 show blank & duplicate samples data. Groundwater data on Cobalt, Strontium, & other metals can be found also in the "3M Cordova 1989/1990 Investigation Report" prepared by 3M on 11-28-90.

Contact telephone and e-mail numbers

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Module 5 References

Environmental Indicators (EIs)

Module References

- "Government Performance and Results Act (GPRA)." Available to download from the Internet: http://www.epa.gov/ooaujeag/notebook/gpranew.htm

- "RCRA Environmental Indicators Progress Report: 1995 Update," Office of Solid Waste, June 1996. Available to download from the Internet: http://www.epa.gov/epaoswer/hazwaste/data/ei.htm

- "RCRA Corrective Action Environmental Indicator (EI) RCRIS code (CA725)." US EPA, November, 1998.

Supplemental References

- Corrective Action for Solid Waste Management Units at Hazardous Waste Management Facilities; Advanced Notice for Proposed Rulemaking (ANPR) May 1, 1996 (61 FR 19432). Available to download from the Internet: ttp://www.epa.gov/epaoswer/hazwaste/ca/subparts.htm

- New Agency Guidance for Groundwater Releases Controlled.

Website References

- OSW Waste Cleanup Website: http://www.epa.gov/epaoswer/osw/cleanup.htm

- RCRA Corrective Action Internet Homepage: http://www.epa.gov/correctiveaction

- Environmental Indicators Website: http://www.epa.gov/Indicator

Fact Sheets

- Environmental Indicators for Corrective Action

Other Resources

- RCRA Hotline Phone Number - (800) 424-9346